REMARKS

The Office Action mailed July 30, 2004 has been carefully reviewed and the foregoing amendment and following remarks have been made in consequence thereof.

Claims 1-12, 17-20, and 22-24 are pending in this application. Claims 1-24 stand rejected. Claims 13-16 and 21 have been canceled.

The rejection of Claims 12-22 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. Specifically, Claim 17 has been amended to reference a "signal generator circuit". Claims 13-16 and 21 have been canceled. Claims 12, 17-20, and 22 depend from independent Claim 11. Accordingly, for at least the reasons set forth above, Applicants respectfully request the Section 112 rejections of Claims 12-22 be withdrawn.

The rejection of Claims 1-24 under 35 U.S.C. § 102 as being anticipated by Slates (U.S. Pat. No. 6,346,807) is respectfully traversed.

Slates describes a digital eddy current proximity system (10) that includes a proximity probe (12) for digitally measuring an impedance that is relative to a gap defined between the probe and a metallic target (T) being monitored. The system also includes a signal generator means (70), a timing control means (80), a sampling means (90), a digital convolution means (100), and a digital signal processor means (110). The signal generator includes a plurality of direct digital synthesis devices (72) that are coupled to a resistance means (40) via a filter means (50) and a buffer, gain, and offset means (60) for driving a plurality of dynamic signals at different frequencies through the resistance means and the probe and for obtaining simultaneous impedance measurements of the probe at different frequencies relative to the gap. Notably, Slates does not describe nor suggest determining a plurality of complex impedance values of the transducer at each of the plurality of frequencies, determining a plurality of gap values using the data structure and the plurality of complex impedance values, or determining the gap using the plurality of gap values.

Claim 1 recites a method of determining a gap between an eddy current proximity transducer and a target, said method comprising "providing a data structure that is populated with data that is relative to a plurality of gap values corresponding to a plurality of complex impedance values of the transducer...exciting the transducer at a plurality of different frequencies...determining a plurality of complex impedance values of the transducer at each

of the plurality of frequencies...determining a plurality of gap values using the data structure and the plurality of complex impedance values...and determining the gap using the plurality of gap values."

Slates does not suggest nor describe a method of determining a gap between an eddy current proximity transducer and a target, wherein the method includes providing a data structure that is populated with data that is relative to a plurality of gap values corresponding to a plurality of complex impedance values of the transducer, exciting the transducer at a plurality of different frequencies, determining a plurality of complex impedance values of the transducer at each of the plurality of frequencies, determining a plurality of gap values using the data structure and the plurality of complex impedance values, and determining the gap using the plurality of gap values. Rather, in contrast to the present invention, Slates does not describe nor suggest a method of determining a plurality of complex impedance values of the transducer at each of the plurality of frequencies, determining a plurality of gap values using the data structure and the plurality of complex impedance values, and determining the gap using the plurality of gap values. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Slates.

Claims 2-9 depend from independent Claim 1. When the recitations of Claims 2-9 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-9 are likewise patentable over Slates.

Claim 11 recites a system for determining a gap between an eddy current proximity transducer and a target, the system comprising "a network comprising said transducer serially coupled to an electrical component...a signal generator circuit operatively coupled to said network, said signal generator circuit configured to drive a current that includes three selectable and programmable direct digital synthesis devices each device configured to generate a plurality of frequencies through said network wherein a first analog voltage is impressed across said network and a second analog voltage is impressed across said transducer...a memory comprising a data structure corresponding to each of the frequencies, said data structure populated with data that is relative to a plurality of gap values based on at least one of the first complex number and the second complex number."

Slates does not suggest nor describe a system for determining a gap between an eddy current proximity transducer and a target, wherein the system includes a network including

the transducer serially coupled to an electrical component, a signal generator circuit operatively coupled to the network, wherein the signal generator circuit is configured to drive a current that includes three selectable and programmable direct digital synthesis devices each device is configured to generate a plurality of frequencies through the network wherein a first analog voltage is impressed across said network and a second analog voltage is impressed across the transducer, and a memory includes a data structure corresponding to each of the frequencies, wherein the data structure populated with data that is relative to a plurality of gap values based on at least one of the first complex number and the second complex number. Rather, in contrast to the present invention, Slates does not describe nor suggest a signal generator circuit that is configured to drive a current including three selectable and programmable direct digital synthesis devices wherein each device is configured to generate a plurality of frequencies and a memory including a data structure corresponding to each of the frequencies, wherein the data structure is populated with data that is relative to a plurality of gap values. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Slates.

Claims 13-16 and 21 have been canceled. Claims 12, 17-20, and 22-24 depend from independent Claim 11. When the recitations of Claims 12, 17-20, and 22-24 are considered in combination with the recitations of Claim 11, Applicants submit that dependent Claims 12, 17-20, and 22-24 are likewise patentable over Slates.

For at least the reasons set forth above, Applicants respectfully request that the 35 U.S.C. § 102 rejection of Claims 1-24 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

Robert B. Reeser III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070